

In re: Gross et al.
Serial No.: 10/686,762
Filed: October 16, 2003
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In the Claims:

1. (Previously Presented) An *in ovo* injection apparatus, comprising:
an egg carrier that holds a plurality of eggs and provides external access to the eggs;

a plurality of injection devices positioned above the carrier, wherein each injection device is configured to contact a respective egg in the carrier and deliver a predetermined dosage of a treatment substance into the egg and/or remove material from the egg; and

an egg support assembly positioned beneath the carrier that is configured to solidly support each egg in the carrier during contact therewith by a respective injection device and to prevent each egg from being pushed downwardly into the carrier by a respective injection device.

2. (Previously Presented) The apparatus of Claim 1, wherein the egg support assembly comprises:

a frame movable between an operative position and a retracted position;
a plate attached to the frame and comprising an array of openings formed therein; and

a plurality of pedestals, each pedestal removably and snugly secured within a respective one of the openings, wherein each pedestal comprises a free end portion configured to engage an egg within the carrier when the frame is in the operative position.

3. (Original) The apparatus of Claim 2, wherein the egg support assembly is operatively associated with the plurality of injection devices such that each pedestal moves upwardly through a respective opening in the carrier to support an egg as a respective injection device makes contact with the egg.

4. (Original) The apparatus of Claim 1, wherein the egg support assembly is configured to lift each egg from the carrier during contact with each egg by a respective injection device.

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5. (Original) The apparatus of Claim 2, wherein a height of the free end portion of each pedestal relative to the plate is adjustable.

6. (Previously Presented) The apparatus of Claim 5, wherein the height of the free end portion of each pedestal relative to the plate is adjustable via one or more shims disposed between the free end portion and the plate.

7. (Previously Presented) The apparatus of Claim 2, wherein each pedestal includes a proximal end opposite from the free end portion, and wherein an O-ring is secured to the proximal end that provides a snug, friction fit when the proximal end is disposed within a respective one of the plate openings.

8. (Previously Presented) The apparatus of Claim 2, wherein each pedestal free end portion has a concave configuration.

9. (Previously Presented) The apparatus of Claim 8, wherein each pedestal free end portion comprises a wall that is inclined relative to a centerline of the pedestal that is between about twenty five degrees and about fifty five degrees (25°-55°).

10. (Original) The apparatus of Claim 2, wherein the support assembly frame is movable via actuators selected from the group consisting of pneumatic actuators, hydraulic actuators, electronic actuators, and electromagnetic actuators.

11. (Previously Presented) An *in ovo* injection apparatus, comprising:
an egg carrier that holds a plurality of eggs and provides external access to the eggs;

a plurality of injection devices positioned above the carrier, wherein each injection device is configured to contact a respective egg in the carrier and deliver a

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predetermined dosage of a treatment substance into the egg and/or remove material from the egg; and

an egg support assembly positioned beneath the carrier that is configured to solidly support each egg in the carrier, wherein the egg support assembly prevents each egg from being pushed downwardly into the carrier by a respective injection device, and wherein the egg support assembly lifts each egg upwardly from the carrier during contact therewith by a respective injection device, wherein the egg support assembly comprises:

a frame movable between an operative position and a retracted position;

a plate attached to the frame and comprising an array of openings formed therein; and

a plurality of pedestals, each pedestal removably and snugly secured within a respective one of the openings, wherein each pedestal comprises a free end portion configured to engage an egg within the carrier when the frame is in the operative position.

12. (Original) The apparatus of Claim 11, wherein the egg support assembly is operatively associated with the plurality of injection devices such that each pedestal moves upwardly through a respective opening in the carrier to support an egg as a respective injection device makes contact with the egg.

13. (Original) The apparatus of Claim 11, wherein a height of the free end portion of each pedestal relative to the plate is adjustable.

14. (Previously Presented) The apparatus of Claim 13, wherein the height of the free end portion of each pedestal relative to the plate is adjustable via one or more shims disposed between the free end portion and the plate.

15. (Previously Presented) The apparatus of Claim 11, wherein each pedestal includes a proximal end opposite from the free end portion, and wherein an O-ring is

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secured to the proximal end that provides a snug, friction fit when the proximal end is disposed within a respective one of the plate openings.

16. (Previously Presented) The apparatus of Claim 11, wherein each pedestal free end portion has a concave configuration.

17. (Previously Presented) The apparatus of Claim 16, wherein each pedestal free end portion comprises a wall that is inclined relative to a centerline of the pedestal that is between about twenty five degrees and about fifty five degrees (25°-55°).

18. (Original) The apparatus of Claim 11, wherein the support assembly frame is movable via actuators selected from the group consisting of pneumatic actuators, hydraulic actuators, electronic actuators, and electromagnetic actuators.

19. (Previously Presented) An *in ovo* injection apparatus, comprising:
an egg carrier that holds a plurality of eggs and provides external access to the eggs;

a plurality of injection devices positioned above the carrier, wherein each injection device is configured to contact a respective egg in the carrier and deliver a predetermined dosage of a treatment substance into the egg and/or remove material from the egg; and

an egg support assembly positioned beneath the carrier that is configured to solidly support each egg in the carrier during contact therewith by a respective injection device, and prevent each egg from being pushed downwardly into the carrier by a respective injection device, wherein the egg support assembly comprises:

a frame movable between an operative position and a retracted position;

a plate attached to the frame and comprising an array of openings formed therein; and

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a plurality of pedestals, each pedestal removably and snugly secured within a respective one of the openings, wherein each pedestal comprises a concave free end portion configured to engage an egg within the carrier when the frame is in the operative position, and wherein a height of the free end portion of each pedestal relative to the plate is adjustable.

20. (Original) The apparatus of Claim 19, wherein the egg support assembly is operatively associated with the plurality of injection devices such that each pedestal moves upwardly through a respective opening in the carrier to support an egg as a respective injection device makes contact with the egg.

21. (Original) The apparatus of Claim 19, wherein the egg support assembly is configured to lift each egg from the carrier during contact with each egg by a respective injection device.

22. (Original) The apparatus of Claim 19, wherein a height of the free end portion of each pedestal relative to the plate is adjustable via one or more shims disposed between the free end portion and the plate.

23. (Previously Presented) The apparatus of Claim 19, wherein each pedestal includes a proximal end opposite from the free end portion, and wherein an O-ring is secured to the proximal end that provides a snug, friction fit when the proximal end is disposed within a respective one of the plate openings.

24. (Previously Presented) The apparatus of Claim 19, wherein each pedestal free end portion comprises a wall that is inclined relative to a centerline of the pedestal that is between about twenty five degrees and about fifty five degrees (25°-55°).

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25. (Original) The apparatus of Claim 19, wherein the support assembly frame is movable via actuators selected from the group consisting of pneumatic actuators, hydraulic actuators, electronic actuators, and electromagnetic actuators.

26. (Previously Presented) A method of injecting eggs *in ovo*, comprising: positioning an egg carrier containing a plurality of eggs beneath a plurality of injection devices, wherein each injection device is configured to contact a respective egg in the carrier and deliver a predetermined dosage of a treatment substance into the egg and/or remove material from the egg; and

supporting the plurality of eggs from beneath the egg carrier while simultaneously delivering a predetermined dosage of a treatment substance into each egg and/or removing material from each egg such that the eggs are prevented from being pushed downwardly into the carrier by a respective injection device.

27. (Previously Presented) The method of Claim 26, wherein supporting the plurality of eggs comprises positioning an egg support assembly beneath the egg carrier, wherein the egg support assembly comprises:

a frame movable between an operative position and a retracted position;
a plate attached to the frame and comprising an array of openings formed therein; and

a plurality of pedestals, each pedestal removably and snugly secured within a respective one of the openings, wherein each pedestal comprises a free end portion configured to engage an egg within the carrier when the frame is in the operative position.

28. (Original) The method of Claim 26, wherein supporting the plurality of eggs comprises lifting the eggs upwardly from the egg carrier.

29. (Previously Presented) The method of Claim 26, wherein each pedestal free end portion has a concave configuration.